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L9: Entry 1 of 16   File: USPT   Feb 25, 2003

DOCUMENT-IDENTIFIER: US 6525716 B1
TITLE: Handwritten data input device having coordinate detection tablet

Abstract Text (1):
A handwritten data input device comprises a coordinate detection tablet for detecting
handwritten data input by handwriting with an input pen, and a program recording
medium therefore, and is characterized in that, merely as a particular symbol such as
a check mark is input by handwriting to an input region of the tablet, the handwritten
data can be converted into a category code corresponding to the particular symbol, for
each and every input region on the tablet. The category codes which indicates the
meanings of the respective marks are stored in the RAM while the particular marks are
associated with the respective handwriting marking boxes on a marking sheet. When a
mark is handwritten in a marking sheet on the tablet, the CPU searches the contents of
the RAM on the basis of the written mark, and converts it into a corresponding
category code.

Brief Summary Text (2):
The present invention relates to a handwritten data input device for inputting data by
taking the data input via handwriting on a tablet, and a program recording medium for
the device.

Detailed Description Text (5):
FIG. 1 is a diagram showing the structure of the handwritten data input system. As
shown, a data input device 1 having a tablet is connected to a host computer 2 via a
communication link. A tablet 3 is provided on the upper surface of the tablet-equipped
data input device 1. The tablet 3 is formed in a tabular shape, and is a pressure
sensitive type coordinate input device, which inputs handwritten data by detecting a
location coordinate of the data on the basis of the pressure of the pen applied
through the marking sheet 4 while the marking sheet 4 is placed on the tablet 3. The
marking sheet 4 is an operation inspection document as shown in FIG. 2B, and items of
the inspection and check boxes (handwriting data filling boxes) in which one of
predetermined check marks is filled, are printed to respectively correspond to each
other. In this particular example, it is pre-designed that one of four kinds of marks
is filled in a box in accordance with the contents of the inspection as can be seen in
FIG. 2A, and they indicate "no abnormality found", "already adjusted or cleaned",
"none of above" and "need repair".

Detailed Description Text (8):
A CPU 11 is a central operation processing device for controlling the entire operation
of the data input device in accordance with various programs loaded in a RAM 12. A
storage device 13 includes a storage medium 14 for pre-storing the operating system,
various application programs, data files, character font data and the like, and a
drive system therefor. The storage medium 14 may be fixedly provided, or detachably
mounted, and the examples thereof are magnetic or optical storage medium, or
semiconductor memory such as floppy disk, hard disk, optical disk or RAM card. The
program or data in the storage medium 14 is loaded into the RAM 12 in accordance with
necessary while controlled by the CPU 11. Further, the CPU 11 controls the storage of
a program or data transmitted from other device, in the storage medium 14, or the use
of a program or data stored in a storage medium provided in some other device, via a
communication link or the like.

Detailed Description Text (9):
The tablet 3 and display/operation unit 5, which are peripheral devices for the

input/output terminals, are connected to the CPU 11 via a bus line, and the CPU 11 controls the operation of these devices in accordance with the input/output program.

Detailed Description Text (10):
FIG. 4 shows the contents of the RAM 12, and various regions are assigned to the RAM 12 in accordance with necessity. A sheet format memory 12-1 stores the sheet format while associating it with one of various types of marking sheets 4, and the sheet format defines the location of a check box of the marking sheet 4 as an input region of the tablet 3. The character recognition program memory 12-2 stores a program for recognizing handwritten data as a character. The recognition dictionary memory 12-3 is a dictionary memory for character recognition, referred to while recognizing a character. The category code conversion table 12-4 is fixedly stores the category code which indicates the meaning of a check mark while associating it with a particular mark for checking, for each input region of the tablet 3.

Detailed Description Text (13):
Next, the operation of the data input device will now be described with reference to the flowchart shown in FIG. 7. The program for realizing each of the functions described in the flowchart is stored in the storage medium 14 in the form of a program code which can be read by the CPU 11, and the contents of the program is loaded into the RAM 12. The same structure as the above can be found in other embodiments which will be later described.

Detailed Description Text (15):
Then, the CPU 11 starts the character recognition program as follows. That is, a check mark handwritten in a check box of the marking sheet 4 is taken in as handwritten data input in an input region on the tablet 3 in accordance with the sheet format (Step A1), and the handwritten data is subjected to the character recognition (symbol recognition) as the data for one character, while referring to the recognition dictionary memory 12-3 (Step A2). Then, the result of the recognition is checked to judge if the data is not recognizable or normally recognized (Step A3). If the data is not recognizable, such a message is displayed on the message display as a warning (Step A4), whereas in the case where it is normally recognized, the operation proceeds to Step A5 for the category code conversion process. That is, the CPU 11 specifies the check box of the marking sheet 4, in which the data is marked, and the category code conversion table 12-4 is searched on the basis of the box number and the result of the recognition in the form of symbol (checked mark). Then, the category code corresponding to the check box number and the checked mark is read. Thus, the checked mark is converted into the corresponding category code. Further, the conversion result (category code) is stored in the handwritten data storing memory 12-5 while associating the result with the check box number (Step A6). The above-described operation is repetitively carried out each time a mark is written in a check box of the marking sheet 4.

Detailed Description Text (21):
The second embodiment will now be described with reference to FIGS. 9 to 12. A tablet-equipped data input device 1 according to the second embodiment, has basically a similar structure to that of the tablet-equipped data input device 1 shown in FIG. 3. Further, a sheet format memory 12-1, a character recognition program memory 12-2, and a recognition dictionary memory 12-3 have basically similar structures to those of the first embodiment shown in FIG. 4.

Detailed Description Text (28):
The third embodiment of the present invention will now be described with reference to FIGS. 13 to 17. A tablet-equipped data input device 1 according to the third embodiment, has basically a similar structure to that of the tablet-equipped data input device 1 shown in FIG. 3. Further, a sheet format memory 12-1, a character recognition program memory 12-2, and a recognition dictionary memory 12-3 have basically similar structures to those of the first embodiment shown in FIG. 4.

Detailed Description Text (39):
A CPU 10 is a central operation processing device for controlling the entire operation of the handwritten data input device in accordance with various programs loaded in a RAM 20. A storage device 30 includes a storage medium 40 for pre-storing the operating system, various application programs, data files, character font data and the like,

and a drive system therefor. The storage medium 40 may be fixedly provided, or
detachably mounted, and the examples thereof are magnetic or optical storage medium,
or semiconductor memory such as floppy disk, hard disk, optical disk or RAM card. The
program or data in the storage medium 40 is loaded into the RAM 20 in accordance with
necessary while controlled by the CPU 10. Further, the CPU 10 controls the storage of
a program or data transmitted via a communication link or the like from other device,
in the storage medium 40, or the use of a program or data stored in a storage medium
provided in some other device, via a communication link or the like.

Detailed Description Text (40):
An input device 50, a display unit 60, and a tablet 70, which are peripheral devices
for the input/output terminals of the CPU, are connected to the CPU 10 each via a bus
line, and the CPU 10 controls the operation of these devices in accordance with the
input/output program.

Detailed Description Text (41):
The input device 50 is a keyboard for inputting character string data and the like, or
various commands. The tablet 70 is formed to have a plate shape, and is a pressure
sensitive type coordinate input device, which inputs handwritten data by detecting a
location coordinate of the data on the basis of the pressure of the pen applied
through a marking sheet, which will be later explained, while the marking sheet is
placed on the tablet 70.

Detailed Description Text (42):
FIG. 19 shows the contents of the storage device 30, and a format file FM, a grade
file PT, a character recognition program PG, and a character recognition dictionary CR
are stored in the storage device 30 such as to be loaded into the RAM 20 in accordance
with necessity. The format file FM stores format data which defines handwriting
marking boxes of a marking sheet as input regions of the tablet 70, while associating
the data with the corresponding type of the marking sheet. The format data shown in
FIG. 20 is a format corresponding to an examination sheet shown in FIG. 22. More
specifically, the examination sheet contains "Test No.", "Student No.", and "Total
Score Box", as handwriting marking boxes for the grader, as well as "Subtotal" and
"Grading Area" which correspond to the respective question. The "area" and "area
location coordinate" are defined in the format file FM as the format data in order to
define each handwriting marking box as a respective input region of the tablet 70. In
the format file FM, "test number", "student number", "score box", "subtotal box (1)",
"grading area (1)", "subtotal (2)", "grading area (2)", . . . are stored as the
"area", and further a two-point diagonal coordinates (upper left coordinate, lower
right coordinate) for specifying a rectangular region, are stored as "area location
coordinate". For each of the areas, "attribute" which indicates if an area is for
inputting a handwritten numeral, or a handwritten symbol, is stored, and also
"allotted point" is stored while it is associated with a respective grading area. In
this case, if the attribute is a symbol, the allotted point is stored for each symbol.

Detailed Description Text (44):
Next, the operation of the handwritten data input device of the fourth embodiment will
now be described with reference to the flowcharts shown in FIGS. 23 to 26. The program
for realizing each of the functions described in the flowchart is stored in the
storage medium 40 in the form of a program code which can be read by the CPU 10, and
the contents of the program are loaded into the RAM 22.

Detailed Description Text (47):
When a handwriting is input in a grading area. (that is, YES in Step D3), the score
recognition process is carried out in accordance with the flowchart shown in FIG. 24.
That is, the data written in the grading area is cut out (Step E1). In this case, the
cutout process is carried out for one character string on the basis of the spatial and
time intervals between strokes. Then, the location of the writing is detected (Step
E2). In other words, to which grading area, and to which location of the grading area,
the writing is made, are detected, and the type of the grading area is detected on the
basis of the detection result (Step E3). It should be noted here that in the format
data, the attribute is defined for each region, and therefore the type of the grading
area is judged by referring to the attribute. Then, if it is a grading area where a
symbol such as ".smallcircle.", "X", . . . is to be written, the operation proceeds to

the Step E10, where the character recognition process is carried out. In this case, the handwritten data obtained by cutting out characters, and the contents of the character recognition dictionary CR are collated with each other, and thus a symbol such as ".smallcircle.", "X", . . . is recognized. Then, the process for obtaining the score on the basis of the result of the recognition is carried out (Step E11). For example, when a recognized symbol is ".smallcircle.", an allotted point of "10" is obtained, and when it is "X", an allotted point of "0" is obtained, in accordance with the contents of the format file FM. However, as can be seen in FIG. 20, the same type of symbol may have a different allotted point, if it is written in a different grading area. The score thus obtained is registered and saved in the grade file PT as score data for the grading area, while associating the score data with the student (Step E9). Since the grading area as well as the location in the area, to which the writing is made, are already detected in the above-described Step E2, the score is judged as to which grading area and which question it corresponds to, on the contents of the detection, and the score is written in the grade file PT as the score data which corresponds to the area and the location of the area. This operation keeps on returning to the Step D2 until the finish of grading is detected in the Step DB in FIG. 23. Therefore, when the symbol written area is in the grading area (1), the above operation is repeated each time a symbol is handwritten in the grading for each question within the area, and the score for each question in the grading area (1) is obtained, to be registered and saved in the grade file PT.

Current US Cross Reference Classification (3):
345/179

CLAIMS:

8. An article of manufacture comprising a computer usable medium having computer readable program code means embodied therein, the computer readable program code means comprising: computer readable program code means for causing a computer to store, in a format memory, format information of an input sheet including positions of an input area, for each type of input sheet, the input sheet to be held on a tablet which detects positional coordinates of a handwritten item that is handwritten in one of the input areas, and outputs a detection signal in correspondence with detected coordinates; computer readable program, code means for causing a computer to store, in a code memory, handwritten items to be handwritten in each of the input areas and a category code that corresponds to each of the handwritten items, for each of the input areas of the input sheet; computer readable program code means for causing a computer to recognize, when the input sheet is placed on the tablet, a handwritten item input in one of the input areas on the basis of the detection signal output from the tablet; and computer readable program code means for causing a computer to identify an input area in which the handwritten item is input, on the basis of the detection signal output from the tablet and the format information stored in the format memory, read a category code that corresponds to the identified input area and the handwritten item recognized by the recognition unit, from the code memory, and convert the handwritten item to a corresponding category code.

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Search Results - Record(s) 1 through 10 of 29 returned.

☐ 1.   Document ID: US 6529920 B1

L22: Entry 1 of 29   File: USPT   Mar 4, 2003

US-PAT-NO: 6529920
DOCUMENT-IDENTIFIER: US 6529920 B1

TITLE: Multimedia linking device and method

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 2.   Document ID: US 6421042 B1

L22: Entry 2 of 29   File: USPT   Jul 16, 2002

US-PAT-NO: 6421042
DOCUMENT-IDENTIFIER: US 6421042 B1

TITLE: Coordinate position inputting/detecting device, a method for
inputting/detecting the coordinate position, and a display board system

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 3.   Document ID: US 6353193 B1

L22: Entry 3 of 29   File: USPT   Mar 5, 2002

US-PAT-NO: 6353193
DOCUMENT-IDENTIFIER: US 6353193 B1

TITLE: Electronic whiteboard system and method

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 4.   Document ID: US 6310615 B1

L22: Entry 4 of 29   File: USPT   Oct 30, 2001

US-PAT-NO: 6310615
DOCUMENT-IDENTIFIER: US 6310615 B1
** See image for Certificate of Correction **

TITLE: Dual mode eraser

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 5. Document ID: US 6259043 B1

L22: Entry 5 of 29   File: USPT   Jul 10, 2001

US-PAT-NO: 6259043
DOCUMENT-IDENTIFIER: US 6259043 B1

TITLE: Methods, systems and products pertaining to a digitizer for use in paper based
record systems

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 6. Document ID: US 6212297 B1

L22: Entry 6 of 29   File: USPT   Apr 3, 2001

US-PAT-NO: 6212297
DOCUMENT-IDENTIFIER: US 6212297 B1

TITLE: Handwritten keyboardless entry computer system

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 7. Document ID: US 6211863 B1

L22: Entry 7 of 29   File: USPT   Apr 3, 2001

US-PAT-NO: 6211863
DOCUMENT-IDENTIFIER: US 6211863 B1

TITLE: Method and software for enabling use of transcription system as a mouse

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 8. Document ID: US 6191778 B1

L22: Entry 8 of 29   File: USPT   Feb 20, 2001

US-PAT-NO: 6191778
DOCUMENT-IDENTIFIER: US 6191778 B1

TITLE: Transcription system kit for forming composite images

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | | KWIC | Draw Desc | Image |

☐ 9. Document ID: US 6177927 B1

L22: Entry 9 of 29   File: USPT   Jan 23, 2001

US-PAT-NO: 6177927
DOCUMENT-IDENTIFIER: US 6177927 B1

TITLE: Transcription system kit

`Full` | `Title` | `Citation` | `Front` | `Review` | `Classification` | `Date` | `Reference` | `Sequences` | `Attachments` `KWIC` | `Draw Desc` | `Image`

☐   10.   Document ID: US 6147681 A

L22: Entry 10 of 29   File: USPT   Nov 14, 2000

US-PAT-NO: 6147681
DOCUMENT-IDENTIFIER: US 6147681 A

TITLE: Detector for use in a transcription system

`Full` | `Title` | `Citation` | `Front` | `Review` | `Classification` | `Date` | `Reference` | `Sequences` | `Attachments` `KWIC` | `Draw Desc` | `Image`

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